09/927,777

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*** YOU HAVE NEW MAIL ***

=> s nanoparticle? and accelerat? (3a) mov?
L1 16 NANOPARTICLE? AND ACCELERAT? (3A) MOV?

=> s l1 and electrode?
L2 6 L1 AND ELECTRODE?

=> dup rem l2
PROCESSING COMPLETED FOR L2
L3 6 DUP REM L2 (0 DUPLICATES REMOVED)

=> d l3 bib abs 1-6

L3 ANSWER 1 OF 6 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-430409 [40] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]
DNN N2003-343591 DNC C2003-113834
TI Detecting nucleic acid having two portions, by providing **nanoparticles** having oligonucleotides attached to it, contacting nucleic acid and **nanoparticles** to allow hybridization, and observing detectable change.
DC B04 D16 L03 S03 U11
IN LETSINGER, R L; LU, G; MIRKIN, C A; TATON, T A; PARK, S
PA (LETS-I) LETSINGER R L; (LUGG-I) LU G; (MIRK-I) MIRKIN C A; (TATO-I) TATON T A; (NANO-N) NANOSPHERE INC
CYC 100
PI WO 2003035829 A2 20030501 (200340)* EN 467p
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM

ZW
US 2003087242 A1 20030508 (200345)
ADT WO 2003035829 A2 WO 2002-US32088 20021008; US 2003087242 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-176409P 20000113, Provisional US 2000-192699P 20000328, Provisional US 2000-200161P 20000426, Provisional US 2000-213906P 20000626, CIP of US 2000-603830 20000626, Provisional US 2000-224631P 20000811, Provisional US 2000-254392P 20001208, Provisional US 2000-254418P 20001208, Provisional US 2000-255235P 20001211, Provisional US 2000-255236P 20001211, CIP of US 2001-760500 20010112, CIP of US 2001-820279 20010328, Provisional US 2001-282640P 20010409, CIP of US 2001-927777 20010810, US 2001-8978 20011207
FDT US 2003087242 A1 CIP of US 6361944
PRAI US 2001-8978 20011207; US 2001-327864P 20011009; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-176409P 20000113; US 2000-192699P 20000328; US 2000-200161P 20000426; US 2000-213906P 20000626; US 2000-603830 20000626; US 2000-224631P 20000811; US 2000-254392P 20001208; US 2000-254418P 20001208; US 2000-255235P 20001211; US 2000-255236P 20001211; US 2001-760500 20010112; US 2001-820279 20010328; US 2001-282640P 20010409; US 2001-927777 20010810
AN 2003-430409 [40] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]
AB WO2003035829 A UPAB: 20030906
NOVELTY - Detecting (M1) nucleic acid having two portions, comprising providing **nanoparticles** having oligonucleotides attached to it, which has a sequence complementary to sequence of two portions of nucleic acid, contacting nucleic acid and **nanoparticles**, to allow hybridization of oligonucleotides with two or more portions of nucleic acid, and observing a detectable change brought about by hybridization, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a kit comprising a container holding a composition comprising two types of **nanoparticles** having oligonucleotides attached to it, where the oligonucleotides on the first type of **nanoparticles** has a sequence complementary to the sequence of a first portion of a nucleic acid, and the oligonucleotides on the second type of **nanoparticles** has a sequence complementary to the sequence of a second portion of the nucleic acid;

(2) an aggregate probe comprising at least two types of **nanoparticles** having oligonucleotides attached to it, where the **nanoparticles** of the aggregate probe is bound to each other as a result of the hybridization of some of the oligonucleotides attached to them, and has oligonucleotides having attached to it which have a sequence complementary to a portion of the sequence of a nucleic acid;

(3) a core probe comprising at least two types of **nanoparticles** having oligonucleotides attached to it, where the **nanoparticles** is bound to each other as a result of hybridization of some of the oligonucleotides attached to it;

(4) a substrate having **nanoparticles** attached to it;

(5) a metallic or semiconductor **nanoparticle** having oligonucleotides attached to it, where the oligonucleotides are labeled with fluorescent molecules at the ends not attached to the **nanoparticle**;

(6) a satellite probe comprising a particle having oligonucleotides attached to it, and probe oligonucleotides hybridized to the

oligonucleotides attached to the **nanoparticles**, and having a first portion and a second portion, where the first portion has a sequence complementary to the sequence of the first portion of oligonucleotides attached to the particles, and both portions has sequences complementary to portions of the sequence of the nucleic acid, and the probe oligonucleotide further has a reporter molecule attached to one end;

(7) a composition comprising at least two types of **nanoparticles** having oligonucleotides attached to it;

(8) an assembly of containers comprising a first and second containers holding **nanoparticles** having oligonucleotides attached to it, which has a sequence complementary to that of the oligonucleotides attached to the **nanoparticles** in the containers;

(9) a **nanoparticle** (I) having several different oligonucleotides attached to it which comprises recognition oligonucleotides, each comprising a spacer portion designed so that it is bound to the **nanoparticle**, and a recognition portion having a sequence complementary to a portion of the sequence of the nucleic acid or another oligonucleotide, and optionally a type of diluent oligonucleotides;

(10) binding (M2) oligonucleotides to charged **nanoparticles** to produce stable **nanoparticle**-oligonucleotide conjugates;

(11) **nanoparticle**-oligonucleotide conjugates (II) which are **nanoparticles** having oligonucleotides attached to them which is present on the surface of the **nanoparticles** at a surface density sufficient so that the conjugates are stable and having a sequence complementary to a portion of the sequence of a nucleic acid or another oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) oligonucleotides having a covalently bound cyclic disulfide or polythiol functional group that can bind to the **nanoparticles**;

(13) nanomaterials (III) or nanostructures composed of **nanoparticles** having oligonucleotides attached to it, where the **nanoparticles** are held together by oligonucleotide connectors;

(14) detection of an analyte, preferably polyvalent analyte;

(15) preparing a nanoprobe conjugate for detecting an analyte;

(16) a nanomaterial produced, by providing linking oligonucleotide comprising two portions, two types of **nanoparticles** having oligonucleotides attached to it, and a complex comprised of streptavidin or avidin bound to two or more biotin molecules, each having an oligonucleotide bound to the biotin molecule, which has a sequence that is complementary to the second portion of the linking oligonucleotide, and contacting the first and second types of **nanoparticles**, the linking oligonucleotides and the complex, to allow hybridization of the oligonucleotides on the **nanoparticles** to each other and to the linking oligonucleotide and the hybridization of the oligonucleotide of the complexes to the linking oligonucleotides so that a desired nanomaterials or nanostructures is formed;

(17) **accelerating movement** of a **nanoparticle** to an **electrode** surface; and

(18) increasing stringency of hybridization that employs a substrate having bound to capture oligonucleotide probes and labeled oligonucleotide detection probes.

USE - M1, (I), (II) and the aggregate probe are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an **el ctrode** surface. (I) and (II) are useful for fabrication, and for separating a selected nucleic acid having two portions from other nucleic acids. (I),

(II) and the aggregate probe are useful for detecting an analyte (especially polyvalent analyte) in a sample. (All claimed.)
ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.
Dwg.0/71

L3 ANSWER 2 OF 6 USPATFULL on STN
AN 2003:294281 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
IN Park, So-Jung, Austin, TX, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
Mirkin, Chad A., Wilmette, IL, UNITED STATES
PI US 2003207296 A1 20031106
AI US 2002-266983 A1 20021008 (10)
RLI Continuation-in-part of Ser. No. US 2001-8978, filed on 7 Dec 2001, PENDING Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug 2001, PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING
PRAI US 2001-327864P 20011009 (60)
US 2000-254418P 20001208 (60)
US 2000-255236P 20001211 (60)
US 2001-282640P 20010409 (60)
US 2000-224631P 20000811 (60)
US 2000-192699P 20000328 (60)
US 2000-254392P 20001208 (60)
US 2000-255235P 20001211 (60)
US 2000-176409P 20000113 (60)
US 2000-213906P 20000626 (60)
US 2000-200161P 20000426 (60)
US 1996-31809P 19960729 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606
CLMN Number of Claims: 677
ECL Exemplary Claim: 1
DRWN 75 Drawing Page(s)
LN.CNT 12981
AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle** -oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of nanofabrication utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

L3 ANSWER 3 OF 6 USPATFULL on STN
AN 2003:150556 USPATFULL
TI *Use of liquid junction potentials for electrophoresis without applied voltage in a microfluidic channel*
IN Munson, Matthew S., Seattle, WA, UNITED STATES
Cabrera, Catherine R., Seattle, WA, UNITED STATES
Yager, Paul, Seattle, WA, UNITED STATES
Hatch, Anson, Seattle, WA, UNITED STATES
Kamholz, Andrew, Seattle, WA, UNITED STATES
PI US 2003102214 A1 20030605
AI US 2002-268620 A1 20021009 (10)
PRAI US 2001-328328P 20011009 (60)
DT Utility
FS APPLICATION
LREP GREENLEE WINNER AND SULLIVAN P C, 5370 MANHATTAN CIRCLE, SUITE 201, *BOULDER, CO, 80303*
CLMN Number of Claims: 37
ECL Exemplary Claim: 1
DRWN 19 Drawing Page(s)
LN.CNT 2301
AB This invention provides methods for using liquid junction potentials to control the transport of charged particles in fluid streams that are in laminar flow within microfluidic channels. Applications of the methods of this invention include sample preconditioning (removal of interfering substances), electrophoretic separation (fractionation) of charged particles, enhanced or delayed mixing of charged particles across a fluid interface relative to diffusion only, focusing charged particles in a fluid stream in one or two dimensions, and concentration of charged *reactants at a fluid interface.*

L3 ANSWER 4 OF 6 USPATFULL on STN
AN 2003:127030 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
Lu, Gang, Mt Prospect, IL, UNITED STATES
PI US 2003087242 A1 20030508
AI US 2001-8978 A1 20011207 (10)
RLI *Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug 2001,* PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-176409P 20000113 (60)
US 2000-192699P 20000328 (60)
US 2000-200161P 20000426 (60)
US 2000-213906P 20000626 (60)
US 2000-224631P 20000811 (60)
US 2000-254392P 20001208 (60)
US 2000-254418P 20001208 (60)
US 2000-255235P 20001211 (60)
US 2000-255236P 20001211 (60)
US 2001-282640P 20010409 (60)

09567863

DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606
CLMN Number of Claims: 626
ECL Exemplary Claim: 1
DRWN 71 Drawing Page(s)
LN.CNT 12308
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle** -oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of nanofabrication utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 5 OF 6 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2002-608256 [65] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]
DNC C2002-171859
TI Detecting nucleic acid having two portions, by providing **nanoparticles** having oligonucleotides attached to it, contacting nucleic acid and **nanoparticles** to allow hybridization, and observing detectable change.
DC B04 D16
IN ELGHANIAN, R; GARIMELLA, V; LETSINGER, R L; LI, Z; MIRKIN, C A; MUCIC, R C; PARK, S; STORHOFF, J J; TATON, T A
PA (NANO-N) NANOSPHERE INC; (ELGH-I) ELGHANIAN R; (GARI-I) GARIMELLA V; (LETS-I) LETSINGER R L; (LIZZ-I) LI Z; (MIRK-I) MIRKIN C A; (MUCI-I) MUCIC R C; (PARK-I) PARK S; (STOR-I) STORHOFF J J; (TATO-I) TATON T A
CYC 98
PI WO 2002046472 A2 20020613 (200265)* EN 442p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2002030593 A 20020618 (200266)
US 2002172953 A1 20021121 (200279)
ADT WO 2002046472 A2 WO 2001-US46418 20011207; AU 2002030593 A AU 2002-30593 20011207; US 2002172953 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-176409P 20000113, Provisional US 2000-192699P 20000328, Provisional US 2000-200161P 20000426, CIP of US

2000-603830 20000626, Provisional US 2000-224631P 20000811, Provisional US 2000-254392P 20001208, Provisional US 2000-255235P 20001211, CIP of US 2001-760500 20010112, CIP of US 2001-820279 20010328, US 2001-927777 20010810

FDT AU 2002030593 A Based on WO 2002046472; US 2002172953 A1 CIP of US 6361944

PRAI US 2001-927777 20010810; US 2000-254392P 20001208; US 2000-254418P 20001208; US 2000-255235P 20001211; US 2000-255236P 20001211; US 2001-760500 20010112; US 2001-820279 20010328; US 2001-282640P 20010409; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-176409P 20000113; US 2000-192699P 20000328; US 2000-200161P 20000426; US 2000-603830 20000626; US 2000-224631P 20000811

AN 2002-608256 [65] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]

AB WO 200246472 A UPAB: 20030919

NOVELTY - Detecting (M1) nucleic acid having two portions, involves providing **nanoparticles** having oligonucleotides attached to it, which has a sequence complementary to sequence of two portions of nucleic acid, contacting nucleic acid and **nanoparticles**, to allow hybridization of oligonucleotides with two or more portions of nucleic acid, and observing a detectable change brought about by hybridization.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a kit comprising a container holding a composition comprising two types of **nanoparticles** having oligonucleotides attached to it, where the oligonucleotides on the first type of **nanoparticles** has a sequence complementary to the sequence of a first portion of a nucleic acid, and the oligonucleotides on the second type of **nanoparticles** has a sequence complementary to the sequence of a second portion of the nucleic acid;

(2) an aggregate probe comprising at least two types of **nanoparticles** having oligonucleotides attached to it, where the **nanoparticles** of the aggregate probe is bound to each other as a result of the hybridization of some of the oligonucleotides attached to them, and has oligonucleotides having attached to it which have a sequence complementary to a portion of the sequence of a nucleic acid;

(3) a core probe comprising at least two types of **nanoparticles** having oligonucleotides attached to it, where the **nanoparticles** is bound to each other as a result of hybridization of some of the oligonucleotides attached to it;

(4) a substrate having **nanoparticles** attached to it;

(5) a metallic or semiconductor **nanoparticle** having oligonucleotides attached to it, where the oligonucleotides are labeled with fluorescent molecules at the ends not attached to the **nanoparticle**;

(6) a satellite probe comprising a particle having oligonucleotides attached to it, and probe oligonucleotides hybridized to the oligonucleotides attached to the **nanoparticles**, and having a first portion and a second portion, where the first portion has a sequence complementary to the sequence of the first portion of oligonucleotides attached to the particles, and both portions has sequences complementary to portions of the sequence of the nucleic acid, and the probe oligonucleotide further has a reporter molecule attached to one end;

(7) a composition comprising at least two types of **nanoparticles** having oligonucleotides attached to it;

(8) an assembly of containers comprising a first and second containers holding **nanoparticles** having oligonucleotides

attached to it, which has a sequence complementary to that of the oligonucleotides attached to the **nanoparticles** in the containers;

(9) a ***nanoparticle*** *(I) having several different* oligonucleotides attached to it which comprises recognition oligonucleotides, each comprising a spacer portion designed so that it is bound to the **nanoparticle**, and a recognition portion having a sequence complementary to a portion of the sequence of the nucleic acid or another oligonucleotide, and optionally a type of diluent oligonucleotides;

(10) binding (M2) oligonucleotides to charged **nanoparticles** to produce stable **nanoparticle**-oligonucleotide conjugates;

(11) **nanoparticle**-oligonucleotide conjugates (II) which are **nanoparticles** having oligonucleotides attached to them which is present on the surface of the **nanoparticles** at a surface density sufficient so that the conjugates are stable and having a sequence *complementary to a portion of the sequence of a nucleic acid or another* oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) oligonucleotides having a covalently bound cyclic disulfide or polythiol functional group that can bind to the **nanoparticles**;

(13) a **nanoparticle** conjugate for detecting an analyte, comprising **nanoparticles** having oligonucleotides bound to it, and oligonucleotide having bound to it a specific binding complement of an analyte having a sequence that is complementary to a portion of the oligonucleotides bound to the **nanoparticles** and are bound, as a result of hybridization, and a linker oligonucleotide having two portions;

(14) nonmaterials (III) or nanostructures composed of **nanoparticles** having oligonucleotides attached to it, where the ***nanoparticles*** *are held together by oligonucleotide connectors;*

(15) a kit for detecting an analyte, comprising a container holding (II), and optional support for observing a detectable change;

(16) a nanomaterial produced, by providing linking oligonucleotide comprising two portions, two types of **nanoparticles** having oligonucleotides attached to it, and a complex comprised of streptavidin or avidin bound to two or more biotin molecules, each having an oligonucleotide bound to the biotin molecule, which has a sequence that is complementary to the second portion of the linking oligonucleotide, and contacting the first and second types of **nanoparticles**, the linking oligonucleotides and the complex, to allow hybridization of the oligonucleotides on the **nanoparticles** to each other and to the linking oligonucleotide and the hybridization of the oligonucleotide of *the complexes to the linking oligonucleotides so that a desired* nanomaterials or nanostructures is formed; and

(17) **accelerating movement** of a **nanoparticle** to an **electrode** surface.

USE - (M1), (I), (II) and the aggregate probe are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an **electrode** surface. (I) and (II) are useful for fabrication, and for separating a selected nucleic acid having two portions from other *nucleic acids. (I), (II) and the aggregate probe are useful for detecting* an analyte (especially polyvalent analyte) in a sample (all claimed).

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.

Dwg.0/67

09567863

AN 2002:307830 USPATFULL
TI Movement of biomolecule-coated **nanoparticles** in an electric field
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Chicago, IL, UNITED STATES
Taton, Thomas Andrew, Chicago, IL, UNITED STATES
Garimella, Viswanadham, Evanston, IL, UNITED STATES
Li, Zhi, Evanston, IL, UNITED STATES
Park, So-Jung, Evanston, IL, UNITED STATES
PI US 2002172953 A1 20021121
AI US 2001-927777 A1 20010810 (9)
RLI Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-176409P 20000113 (60)
US 2000-200161P 20000426 (60)
US 2000-192699P 20000328 (60)
US 2000-254392P 20001208 (60)
US 2000-255235P 20001211 (60)
US 2000-224631P 20000811 (60)
DT Utility
FS APPLICATION
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 598
ECL Exemplary Claim: 1
DRWN 64 Drawing Page(s)
LN.CNT 11435
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle** -oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of nanofabrication utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=>

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=> d his

     (FILE 'HOME' ENTERED AT 16:40:32 ON 21 NOV 2003)

     FILE 'BIOSIS, MEDLINE, CAPLUS, WPIDS, USPATFULL' ENTERED AT 16:40:49 ON
     21 NOV 2003
L1            16 S NANOPARTICLE? AND ACCELERAT? (3A) MOV?
L2             6 S L1 AND ELECTRODE?
L3             6 DUP REM L2 (0 DUPLICATES REMOVED)

=> s nanoparticle? and accelerat? and electrode?
L4           279 NANOPARTICLE? AND ACCELERAT? AND ELECTRODE?

=> s l4 and binding
L5           144 L4 AND BINDING

=> s l5 and binding pair?
L6            20 L5 AND BINDING PAIR?

=> s l6 not l3
L7            17 L6 NOT L3

=> dup rem l7
PROCESSING COMPLETED FOR L7
L8             17 DUP REM L7 (0 DUPLICATES REMOVED)

=> d l8 bib abs 1-17

L8   ANSWER 1 OF 17  USPATFULL on STN
AN      2003:251161  USPATFULL
TI      Enhanced mixing in microfluidic devices
IN      Liu, Robin Hui, Chandler, AZ, UNITED STATES
        Lenigk, Ralf, Chandler, AZ, UNITED STATES
        Singhal, Pankaj, Pasadena, CA, UNITED STATES
        Grodzinski, Piotr, Chandler, AZ, UNITED STATES
        Dai, Xunhu, Gilbert, AZ, UNITED STATES
        Druyor-Sanchez, Roberta L., Mesa, AZ, UNITED STATES
PI      US 2003175947       A1   20030918
AI      US 2002-199948      A1   20020719 (10)
RLI     Continuation of Ser. No. US 2001-993342, filed on 5 Nov 2001, PENDING
DT      Utility
FS      APPLICATION
LREP    DORSEY & WHITNEY LLP, Suite 3400, Four Embarcadero Center, San
        Francisco, CA, 94111-4187
CLMN    Number of Claims: 46
ECL     Exemplary Claim: 1
DRWN    17 Drawing Page(s)
LN.CNT 3600
AB      The present invention provides microfluidic devices and methods for
        enhancing mixing and hybridization kinetics in microfluidic assays. More
        particularly, the present invention is a device and method wherein
        changing the volume of a gas pocket within a microfluidic device
        enhances mixing and reaction kinetics therein. In an embodiment sonic
        frequency is applied to the gas pocket resulting in microstreaming
        phenomena, thereby resulting in enhanced mixing and reaction kinetics.
        In another embodiment, the gas pocket is fluidly connected to a
        microfluidic channel and the volume of the pocket is changed (e.g., by
        heating and cooling of the gas therein), which cause oscillating flow
        within the microfluidic channel, thereby resulting in enhanced mixing
        and reaction kinetics therein.
```

L8 ANSWER 2 OF 17 USPATFULL on STN
AN 2003:140461 USPATFULL
TI Methods for providing extended dynamic range in analyte assays
IN Yguerabide, Juan, La Jolla, CA, UNITED STATES
Yguerabide, Evangelina, La Jolla, CA, UNITED STATES
Warden, Laurence, Poway, CA, UNITED STATES
Peterson, Todd, Coronado, CA, UNITED STATES
PA Genicon Sciences Corporation (U.S. corporation)
PI US 2003096302 A1 20030522
AI US 2002-84844 A1 20020225 (10)
PRAI US 2001-271089P 20010223 (60)
DT Utility
FS APPLICATION
LREP PENNIE AND EDMONDS, 1155 AVENUE OF THE AMERICAS, NEW YORK, NY, 100362711
CLMN Number of Claims: 37
ECL Exemplary Claim: 1
DRWN 31 Drawing Page(s)
LN.CNT 10011
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Methods for enhancing the dynamic range for specific detection of one or more analytes in assays using scattered-light detectable particle labels. The methods involve utilizing variations in detection technique and/or signal processing to extend the dynamic range to either or both of lower and higher concentrations.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 3 OF 17 USPATFULL on STN
AN 2003:131821 USPATFULL
TI Nanoscale wires and related devices
IN Lieber, Charles M., Lexington, MA, UNITED STATES
Duan, Xiangfeng, Somerville, MA, UNITED STATES
Cui, Yi, Union City, CA, UNITED STATES
Huang, Yu, Cambridge, MA, UNITED STATES
Gudiksen, Mark, Watertown, MA, UNITED STATES
Lauhon, Lincoln J., Boston, MA, UNITED STATES
Wang, Jianfang, Goleta, CA, UNITED STATES
Park, Hongkun, Lexington, MA, UNITED STATES
Wei, Qingqiao, Corvallis, OR, UNITED STATES
Liang, Wenjie, Somerville, MA, UNITED STATES
Smith, David C., Midanbury, UNITED KINGDOM
Wang, Deli, Cambridge, MA, UNITED STATES
Zhong, Zhaohui, Cambridge, MA, UNITED STATES
PI US 2003089899 A1 20030515
AI US 2002-196337 A1 20020716 (10)
RLI Continuation-in-part of Ser. No. US 2002-152490, filed on 20 May 2002, ABANDONED Continuation-in-part of Ser. No. US 2002-152490, filed on 20 May 2002, ABANDONED Continuation-in-part of Ser. No. US 2001-935776, filed on 22 Aug 2001, PENDING
PRAI US 2001-292045P 20010518 (60)
US 2001-291896P 20010518 (60)
US 2002-354642P 20020206 (60)
US 2001-348313P 20011109 (60)
US 2000-226835P 20000822 (60)
US 2001-292121P 20010518 (60)
US 2001-292035P 20010518 (60)
US 2000-254745P 20001211 (60)
DT Utility
FS APPLICATION
LREP WOLF GREENFIELD & SACKS, PC, FEDERAL RESERVE PLAZA, 600 ATLANTIC AVENUE, BOSTON, MA, 02210-2211

09567863

CLMN Number of Claims: 709
ECL Exemplary Claim: 1
DRWN 94 Drawing Page(s)
LN.CNT 7456
AB The present invention relates generally to sub-microelectronic circuitry, and more particularly to nanometer-scale articles, including nanoscale wires which can be selectively doped at various locations and at various levels. In some cases, the articles may be single crystals. The nanoscale wires can be doped, for example, differentially along their length, or radially, and either in terms of identity of dopant, concentration of dopant, or both. This may be used to provide both n-type and p-type conductivity in a single item, or in different items in close proximity to each other, such as in a crossbar array. The fabrication and growth of such articles is described, and the arrangement of such articles to fabricate electronic, optoelectronic, or spintronic devices and components. For example, semiconductor materials can be doped to form n-type and p-type semiconductor regions for making a variety of devices such as field effect transistors, bipolar transistors, complementary inverters, tunnel diodes, light emitting diodes, sensors, and the like.

L8 ANSWER 4 OF 17 USPATFULL on STN
AN 2003:127065 USPATFULL
TI Means and methods for detection of **binding** of members of specific **binding pairs**
IN Fritzsche, Wolfgang, Jena, GERMANY, FEDERAL REPUBLIC OF
Czaki, Andrea, Camburg, GERMANY, FEDERAL REPUBLIC OF
Koehler, Johann Michael, Golmsdorf, GERMANY, FEDERAL REPUBLIC OF
Moeller, Robert, Jena, GERMANY, FEDERAL REPUBLIC OF
Schut, Frederik, Den Haag, NETHERLANDS
Oosting, Louis, Groningen, NETHERLANDS
Tan, Paris Som Tjwan, Haren, NETHERLANDS
PI US 2003087277 A1 20030508
AI US 2002-215789 A1 20020809 (10)
RLI Continuation-in-part of Ser. No. US 2001-869206, filed on 25 Jun 2001, PENDING A 371 of International Ser. No. WO 1999-EP10334, filed on 22 Dec 1999, UNKNOWN
PRAI DE 1998-19860547 19981223
DT Utility
FS APPLICATION
LREP JORDAN AND HAMBURG LLP, 122 EAST 42ND STREET, SUITE 4000, NEW YORK, NY, 10168
CLMN Number of Claims: 21
ECL Exemplary Claim: 1
DRWN 9 Drawing Page(s)
LN.CNT 1280
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention relates to an affinity sensor and methods suitable for use in an affinity sensor for detecting specific molecular **binding** events, as is particularly used in the molecular biological field, for example, in the medical diagnostics, in the biosensor technology or in the DNA-microarray technology, and application of the same. A method for detecting **binding** of members of a specific **binding pair** of the invention comprises providing a first member of said **binding pair** coupled to a deposition nucleus and specifically **binding** said first member to a surface-immobilized second member of said pair and determining the electrical resistance of said surface, the method characterized in that after **binding** of the members on said surface an electrically conductive deposit is formed on said surface under conditions that allow said deposit to be formed

specifically on said nucleus or deposit formed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 5 OF 17 USPATFULL on STN
AN 2003:30222 USPATFULL
TI **Nanoparticles** having oligonucleotides attached thereto and uses therefor
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Park, So-Jung, Evanston, IL, UNITED STATES
PI US 2003022169 A1 20030130
AI US 2001-820279 A1 20010328 (9)
RLI Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-176409P 20000113 (60)
US 2000-200161P 20000426 (60)
US 2000-192699P 20000328 (60)
US 2000-254392P 20001208 (60)
US 2000-255235P 20001211 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606
CLMN Number of Claims: 570
ECL Exemplary Claim: 1
DRWN 65 Drawing Page(s)
LN.CNT 11127
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to **nanoparticles** and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle** -oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising **nanoparticles** and methods of nanofabrication utilizing **nanoparticles**. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.F

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 6 OF 17 USPATFULL on STN
AN 2002:265869 USPATFULL
TI Methods and reagents for multiplexed analyte capture, surface array self-assembly, and analysis of complex biological samples
IN Natan, Michael J., Los Altos, CA, UNITED STATES
Schulman, Howard, Palo Alto, CA, UNITED STATES
PA SURROMED, INC., Mountain View, CA (U.S. corporation)
PI US 2002146745 A1 20021010
AI US 2002-115863 A1 20020403 (10)
PRAI US 2001-281228P 20010403 (60)

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US 2001-281041P 20010403 (60)
DT Utility
FS APPLICATION
LREP SWANSON & BRATSCHUN L.L.C., 1745 SHEA CENTER DRIVE, SUITE 330, HIGHLANDS RANCH, CO, 80129
CLMN Number of Claims: 20
ECL Exemplary Claim: 1
DRWN 5 Drawing Page(s)
LN.CNT 1204
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Bifunctional capture probes used for multiplexed assays consist of particles bearing analyte-**binding** moieties and pairing oligonucleotides, which hybridize to an array of surface-bound capture oligonucleotides. Capture probes are combined with a sample containing analytes of interest, extracted from the sample, and then exposed to the oligonucleotide array. Based on their pairing oligonucleotide sequences, the capture probes self-assemble at particular array locations. Bound analytes are then detected using a method, such as mass spectrometry, that can be directed toward particular array locations. Because any number and combination of capture probes can be employed, the method is flexible and able to detect analytes at very low concentrations. Additionally, the method provides the ease of detection associated with position-addressable arrays.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 7 OF 17 USPATFULL on STN
AN 2002:219538 USPATFULL
TI Nanosensors
IN Lieber, Charles M., Lexington, MA, UNITED STATES
Park, Hongkun, Lexington, MA, UNITED STATES
Wei, Qingqiao, Corvallis, OR, UNITED STATES
Cui, Yi, Allston, MA, UNITED STATES
Liang, Wenjie, Somerville, MA, UNITED STATES
PI US 2002117659 A1 20020829
AI US 2001-20004 A1 20011211 (10)
PRAI US 2001-292035P 20010518 (60)
US 2000-254745P 20001211 (60)
DT Utility
FS APPLICATION
LREP WOLF GREENFIELD & SACKS, PC, FEDERAL RESERVE PLAZA, 600 ATLANTIC AVENUE, BOSTON, MA, 02210-2211
CLMN Number of Claims: 102
ECL Exemplary Claim: 1
DRWN 19 Drawing Page(s)
LN.CNT 1657
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Electrical devices comprised of nanowires are described, along with methods of their manufacture and use. The nanowires can be nanotubes and nanowires. The surface of the nanowires may be selectively functionalized. Nanodetector devices are described.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 8 OF 17 USPATFULL on STN
AN 2002:148661 USPATFULL
TI Affinity **binding**-based system for detecting particulates in a fluid
IN Sheppard, Norman F., JR., Bedford, MA, UNITED STATES
Mian, Alec, Cambridge, MA, UNITED STATES
Kellogg, Gregory, Somerville, MA, UNITED STATES
Kieffer-Higgins, Stephen G., Dorchester, MA, UNITED STATES

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Carvalho, Bruce L., Watertown, MA, UNITED STATES
PI US 2002076804 A1 20020620
AI US 2001-989259 A1 20011120 (9)
RLI Division of Ser. No. US 2000-614834, filed on 12 Jul 2000, PATENTED
Division of Ser. No. US 1997-995056, filed on 19 Dec 1997, PATENTED
PRAI US 1996-34327P 19961220 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 South Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 39
ECL Exemplary Claim: 1
DRWN 30 Drawing Page(s)
LN.CNT 2359
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention provides methods an apparatus for detecting and quantifying particulate matter suspended in a fluid. Specifically, the invention provides an integrated, affinity-**binding** based, analytical system comprising a platform for performing an affinity-**binding** based assay for specifically **binding** particulates including microbial cells, and a detection means for detecting the particulates specifically bound to a defined surface or chamber comprising the platform. Methods for using the analytical systems of the invention are also provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 9 OF 17 USPATFULL on STN
AN 2002:60923 USPATFULL
TI Single-molecule selection methods and compositions therefrom
IN Cubicciotti, Roger S., Montclair, NJ, UNITED STATES
PI US 2002034757 A1 20020321
AI US 2001-907385 A1 20010717 (9)
RLI Continuation of Ser. No. US 1998-81930, filed on 20 May 1998, GRANTED, Pat. No. US 6287765
DT Utility
FS APPLICATION
LREP LICATA & TYRRELL P.C., 66 E. MAIN STREET, MARLTON, NJ, 08053
CLMN Number of Claims: 129
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 15716
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Single-molecule selection methods are provided for identifying target-**binding** molecules from diverse sequence and shape libraries. Complexes and imprints of selected target-**binding** molecules are also provided. The subject selection methods are used to identify oligonucleotide and nonnucleotide molecules with desirable properties for use in pharmaceuticals, drug discovery, drug delivery, diagnostics, medical devices, cosmetics, agriculture, environmental remediation, smart materials, packaging, microelectronics and nanofabrication. Single oligonucleotide molecules with desirable **binding** properties are selected from diverse sequence libraries and identified by amplification and sequencing. Alternatively, selected oligonucleotide molecules are identified by sequencing without amplification. Nonnucleotide molecules with desirable properties are identified by single-molecule selection from libraries of conjugated molecules or nucleotide-encoded nonnucleotide molecules. Alternatively, target-specific nonnucleotide molecules are prepared by imprinting selected oligonucleotide molecules into nonnucleotide molecular media. Complexes and imprints of molecules identified by single-molecule selection are shown to have broad utility as drugs, prodrugs, drug

delivery systems, willfully reversible cosmetics, diagnostic reagents, sensors, transducers, actuators, adhesives, adherents and novel multimolecular devices.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 10 OF 17 USPATFULL on STN
AN 2002:310615 USPATFULL
TI Compositions and methods for analyte detection
IN Cote , Gerard L., College Station, TX, United States
Pishko, Michael V., College Station, TX, United States
Sirkar, Kaushik, College Station, TX, United States
Russell, Ryan, College Station, TX, United States
Anderson, Richard Rox, Lexington, MA, United States
PA The Texas A&M University System, College Station, TX, United States (U.S. corporation)
The General Hospital Corporation, Boston, MA, United States (U.S. corporation)
PI US 6485703 B1 20021126
AI US 1999-354914 19990709 (9)
PRAI US 1998-94980P 19980731 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Hartley, Michael G.
LREP Howrey Simon Arnold & White, LLP
CLMN Number of Claims: 11
ECL Exemplary Claim: 1
DRWN 23 Drawing Figure(s); 16 Drawing Page(s)
LN.CNT 4501
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Provided are a variety of chemically sensitive, stable (insoluble over a specified period of time), nontoxic, and non-antigenic hydrogel particles which undergo a measurable change in at least one electrochemical or optical property as a function of interaction with one or more substance(s) to be detected. Also provided are methods of using these hydrogel particles to detect one or more selected analytes, and in certain aspects detect one or more analytes in vivo. Further provided are devices used to detect and measure the optical or electrochemical changes.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 11 OF 17 USPATFULL on STN
AN 2001:223894 USPATFULL
TI Methods, procedures, and formats for using microelectronic array devices to perform multiplex immunoassay analyses
IN Windhab, Norbert, Hofheim, Germany, Federal Republic of
Heller, Michael J., Encinitas, CA, United States
Anderson, Richard R., Encinitas, CA, United States
Fiechtner, Michael D., Poway, CA, United States
Nova, Tina S., Rancho Santa Fe, CA, United States
Schweitzer, Markus, Frankfurt am Main, Germany, Federal Republic of
Sundquist, Alfred R., San Diego, CA, United States
Brucher, Christoph, Sulzbach, Germany, Federal Republic of
Orwick, Jill M., San Diego, CA, United States
Muller, Jochen, Diez, Germany, Federal Republic of
Raddatz, Stefan, Wiesbaden, Germany, Federal Republic of
Ackley, Donald E., Cardiff, CA, United States
Hamon, Christian, Frankfurt am Main, Germany, Federal Republic of
PI US 2001049111 A1 20011206
AI US 2001-783763 A1 20010214 (9)
RLI Continuation-in-part of Ser. No. US 1999-374338, filed on 13 Aug 1999,

09567863

PENDING
DT Utility
FS APPLICATION
LREP *LYON & LYON LLP, 633 WEST FIFTH STREET, SUITE 4700, LOS ANGELES, CA,* 90071
CLMN Number of Claims: 112
ECL Exemplary Claim: 1
DRWN 11 Drawing Page(s)
LN.CNT 2862
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention relates to devices and methods for carrying out multi-step and multiplex immunoaffinity **binding** reactions in microscopic formats. In particular, these devices and methods allow the user to rapidly carry out multiple immunoassays in the same sample volume, and to rapidly resolve the results of those immunoassays in an electronically assisted format. The assays may be further multiplexed in that *several samples may be analyzed and visualized on the same* microelectronic array. In addition, the methods and procedures of the invention allow the use of electronic stringency to further improve the specificity and accuracy of the immunoassays on the microelectronic array devices

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 12 OF 17 USPATFULL on STN
AN 2001:188392 USPATFULL
TI Mutations in and genomic structure of HERG - a long QT syndrome gene
IN Keating, Mark, Brookline, MA, United States
Splawski, Igor, Alston, MA, United States
PI *US 2001034024* A1 *20011025*
AI US 2000-735995 A1 20001214 (9)
RLI Division of Ser. No. US 1999-226012, filed on 6 Jan 1999, GRANTED, Pat. No. US 6207383 Continuation-in-part of Ser. No. US 1998-122847, filed on 27 Jul 1998, ABANDONED
DT Utility
FS APPLICATION
LREP ROTHWELL, FIGG, ERNST & MANBECK, P.C., 555 13TH STREET, N.W., SUITE 701, EAST TOWER, WASHINGTON, DC, 20004
CLMN Number of Claims: 30
ECL Exemplary Claim: 1
DRWN 21 Drawing Page(s)
LN.CNT 4048
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention relates to the determination of the genomic structure of HERG which is a gene associated with long QT syndrome. The sequences of the 15 intron/exon junctions has been determined and this information is useful in devising primers for amplifying and sequencing across all of the exons of the gene. This is useful for determining the presence or absence of mutations which are known to cause long QT syndrome. Also disclosed are many new mutations in HERG which have been found to be associated with long QT syndrome.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 13 OF 17 USPATFULL on STN
AN *2001:208448 USPATFULL*
TI Affinity **binding**-based system for detecting particulates in a fluid
IN Sheppard, Jr., Norman F., Bedford, MA, United States
Mian, Alec, Cambridge, MA, United States
Kellogg, Gregory, Somerville, MA, United States
Kieffer-Higgins, Stephen G., Dorchester, MA, United States

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Carvalho, Bruce L., Watertown, MA, United States
PA Tecan Trading AG, Baar, Switzerland (non-U.S. corporation)
PI US 6319468 B1 20011120
AI US 2000-614834 20000712 (9)
RLI Continuation of Ser. No. US 1997-995056, filed on 19 Dec 1997, now patented, Pat. No. US 6143247 Continuation-in-part of Ser. No. US 1996-768990, filed on 18 Dec 1996
PRAI US 1996-34327P 19961220 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Le, Long V.; Assistant Examiner: Do, Pensee T.
LREP McDonnell Boehnen Hulbert & Berghoff
CLMN Number of Claims: 29
ECL Exemplary Claim: 1
DRWN 30 Drawing Figure(s); 30 Drawing Page(s)
LN.CNT 2336
AB This invention provides methods and apparatus for detecting and quantifying particulate matter suspended in a fluid. Specifically, the invention provides an integrated, affinity-**binding** based, analytical system comprising a platform for performing an affinity-**binding** based assay for specifically **binding** particulates including microbial cells, and a detection device for detecting the particulates specifically bound to a defined surface or chamber comprising the platform. Methods for using the analytical systems of the invention are also provided.

L8 ANSWER 14 OF 17 USPATFULL on STN
AN 2001:152673 USPATFULL
TI Methods for detecting and identifying single molecules
IN Cubicciotti, Roger S., Montclair, NJ, United States
PA Molecular Machines, Inc., Montclair, NJ, United States (U.S. corporation)
PI US 6287765 B1 20010911
AI US 1998-81930 19980520 (9)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Fredman, Jeffrey
LREP Licata & Tyrrell P.C.
CLMN Number of Claims: 27
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 15456
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Multimolecular devices and drug delivery systems prepared from synthetic heteropolymers, heteropolymeric discrete structures, multivalent heteropolymeric hybrid structures, aptameric multimolecular devices, multivalent imprints, tethered specific recognition devices, paired specific recognition devices, nonaptameric multimolecular devices and immobilized multimolecular structures are provided, including molecular adsorbents and multimolecular adherents, adhesives, transducers, switches, sensors and delivery systems. Methods for selecting single synthetic nucleotides, shape-specific probes and specifically attractive surfaces for use in these multimolecular devices are also provided. In addition, paired nucleotide-nonnucleotide mapping libraries for transposition of selected populations of selected nonoligonucleotide molecules into selected populations of replicatable nucleotide sequences are described.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 15 OF 17 USPATFULL on STN

09567863

AN 2001:116434 USPATFULL
TI **Binding acceleration** techniques for the detection of analytes
IN *Blackburn, Gary, Glendora, CA, United States*
Creager, Stephen E., Central, SC, United States
Fraser, Scott, La Canada, CA, United States
Irvine, Bruce D., Glendora, CA, United States
Meade, Thomas J., Altadena, CA, United States
O'Connor, Stephen D., Pasadena, CA, United States
Terbrueggen, Robert H., Manhattan Beach, CA, United States
Vielmetter, Jost G., Pasadena, CA, United States
Welch, Thomas W., Pasadena, CA, United States
PA Clinical Micro Sensors, Inc., Pasadena, CA, United States (U.S. corporation)
PI US 6264825 B1 20010724
AI US 1999-338726 19990623 (9)
RLI Continuation of Ser. No. US 1998-134058, filed on 14 Aug 1998
PRAI US 1998-90389P 19980623 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Tung, T.; Assistant Examiner: Noguerola, Alex
LREP Flehr Hohabch Test Albritton & Herbert LLP, Trecartin, Esq., Richard F., Silva, Esq., Robin M.
CLMN Number of Claims: 29
ECL Exemplary Claim: 1
DRWN 49 Drawing Figure(s); 22 Drawing Page(s)
LN.CNT 5644
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention relates to compositions and methods useful in the ***acceleration*** *of* ***binding*** *of target analytes to capture* ligands on surfaces. Detection proceeds through the use of an electron transfer moiety (ETM) that is associated with the target analyte, either directly or indirectly, to allow electronic detection of the ETM.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 16 OF 17 USPATFULL on STN
AN 2001:43941 USPATFULL
TI Mutations in and genomic structure of HERG--a long QT syndrome gene
IN Keating, Mark T., Salt Lake City, UT, United States
Splawski, Igor, Salt Lake City, UT, United States
PA University of Utah Research Foundation, Salt Lake City, UT, United States *(U.S. corporation)*
PI US 6207383 B1 20010327
AI US 1999-226012 19990106 (9)
RLI Continuation-in-part of Ser. No. US 1998-122847, filed on 27 Jul 1998, now abandoned
DT Utility
FS Granted
EXNAM Primary Examiner: Jones, W. Gary; Assistant Examiner: Souaya, Jehanne
LREP Rothwell, Figg, Ernst & Manbeck, P.C.
CLMN Number of Claims: 16
ECL Exemplary Claim: 7
DRWN 55 Drawing Figure(s); 21 Drawing Page(s)
LN.CNT 4033
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention relates to the determination of the genomic structure of HERG which is a gene associated with long QT syndrome. The sequences of the 15 intron/exon junctions has been determined and this information is useful in devising primers for amplifying and sequencing across all of the exons of the gene. This is useful for determining the presence or absence of mutations which are known to cause long QT syndrome. Also

disclosed are many new mutations in HERG which have been found to be associated with long QT syndrome.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 17 OF 17 USPATFULL on STN
AN 2000:149670 USPATFULL
TI Affinity **binding**-based system for detecting particulates in a fluid
IN Sheppard, Jr., Norman F., Bedford, MA, United States
Mian, Alec, Cambridge, MA, United States
Kellogg, Gregory, Somerville, MA, United States
Kieffer-Higgins, Stephen G., Dorchester, MA, United States
Carvalho, Bruce L., Watertown, MA, United States
PA Gamera Bioscience Inc., Medford, MA, United States (U.S. corporation)
PI US 6143247 20001107
AI US 1997-995056 19971219 (8)
PRAI US 1996-34327P 19961220 (60)
DT Utility
FS Granted
EXNAM Primary Examiner: Chin, Christopher L.; Assistant Examiner: Do, Pensee T.
LREP McDonnell Boehnen Hulbert & Berghoff
CLMN Number of Claims: 40
ECL Exemplary Claim: 1
DRWN 30 Drawing Figure(s); 30 Drawing Page(s)
LN.CNT 2448
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention provides methods an apparatus for detecting and quantifying particulate matter suspended in a fluid. Specifically, the invention provides an integrated, affinity-**binding** based, analytical system comprising a platform for performing an affinity-**binding** based assay for specifically **binding** particulates including microbial cells, and a detection means for detecting the particulates specifically bound to a defined surface or chamber comprising the platform. Methods for using the analytical systems of the invention are also provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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(FILE 'HOME' ENTERED AT 16:40:32 ON 21 NOV 2003)

FILE 'BIOSIS, MEDLINE, CAPLUS, WPIDS, USPATFULL' ENTERED AT 16:40:49 ON 21 NOV 2003

L1 16 S NANOPARTICLE? AND ACCELERAT? (3A) MOV?
L2 6 S L1 AND ELECTRODE?
L3 6 DUP REM L2 (0 DUPLICATES REMOVED)
L4 279 S NANOPARTICLE? AND ACCELERAT? AND ELECTRODE?
L5 144 S L4 AND BINDING
L6 20 S L5 AND BINDING PAIR?
L7 17 S L6 NOT L3
L8 17 DUP REM L7 (0 DUPLICATES REMOVED)

=> s l8 and movement
L9 11 L8 AND MOVEMENT

=> d l9 bib abs 1-11

L9 ANSWER 1 OF 11 USPATFULL on STN
AN 2003:251161 USPATFULL
TI Enhanced mixing in microfluidic devices
IN Liu, Robin Hui, Chandler, AZ, UNITED STATES
Lenigk, Ralf, Chandler, AZ, UNITED STATES
Singhal, Pankaj, Pasadena, CA, UNITED STATES
Grodzinski, Piotr, Chandler, AZ, UNITED STATES
Dai, Xunhu, Gilbert, AZ, UNITED STATES
Druyor-Sanchez, Roberta L., Mesa, AZ, UNITED STATES
PI US 2003175947 A1 20030918
AI US 2002-199948 A1 20020719 (10)
RLI Continuation of Ser. No. US 2001-993342, filed on 5 Nov 2001, PENDING
DT Utility
FS APPLICATION
LREP DORSEY & WHITNEY LLP, Suite 3400, Four Embarcadero Center, San Francisco, CA, 94111-4187
CLMN Number of Claims: 46
ECL Exemplary Claim: 1
DRWN 17 Drawing Page(s)
LN.CNT 3600
AB The present invention provides microfluidic devices and methods for enhancing mixing and hybridization kinetics in microfluidic assays. More particularly, the present invention is a device and method wherein changing the volume of a gas pocket within a microfluidic device enhances mixing and reaction kinetics therein. In an embodiment sonic frequency is applied to the gas pocket resulting in microstreaming phenomena, thereby resulting in enhanced mixing and reaction kinetics. In another embodiment, the gas pocket is fluidly connected to a microfluidic channel and the volume of the pocket is changed (e.g., by heating and cooling of the gas therein), which cause oscillating flow within the microfluidic channel, thereby resulting in enhanced mixing and reaction kinetics therein.

L9 ANSWER 2 OF 11 USPATFULL on STN
AN 2003:140461 USPATFULL
TI Methods for providing extended dynamic range in analyte assays
IN Yguerabide, Juan, La Jolla, CA, UNITED STATES
Yguerabide, Evangelina, La Jolla, CA, UNITED STATES
Warden, Laurence, Poway, CA, UNITED STATES
Peterson, Todd, Coronado, CA, UNITED STATES

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PA Genicon Sciences Corporation (U.S. corporation)
PI US 2003096302 A1 20030522
AI US 2002-84844 A1 20020225 (10)
PRAI US 2001-271089P 20010223 (60)
DT Utility
FS APPLICATION
LREP PENNIE AND EDMONDS, 1155 AVENUE OF THE AMERICAS, NEW YORK, NY, 100362711
CLMN Number of Claims: 37
ECL Exemplary Claim: 1
DRWN 31 Drawing Page(s)
LN.CNT 10011
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Methods for enhancing the dynamic range for specific detection of one or more analytes in assays using scattered-light detectable particle labels. The methods involve utilizing variations in detection technique and/or signal processing to extend the dynamic range to either or both of lower and higher concentrations.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 3 OF 11 USPATFULL on STN
AN 2003:131821 USPATFULL
TI Nanoscale wires and related devices
IN Lieber, Charles M., Lexington, MA, UNITED STATES
Duan, Xiangfeng, Somerville, MA, UNITED STATES
Cui, Yi, Union City, CA, UNITED STATES
Huang, Yu, Cambridge, MA, UNITED STATES
Gudiksen, Mark, Watertown, MA, UNITED STATES
Lauhon, Lincoln J., Boston, MA, UNITED STATES
Wang, Jianfang, Goleta, CA, UNITED STATES
Park, Hongkun, Lexington, MA, UNITED STATES
Wei, Qingqiao, Corvallis, OR, UNITED STATES
Liang, Wenjie, Somerville, MA, UNITED STATES
Smith, David C., Midanbury, UNITED KINGDOM
Wang, Deli, Cambridge, MA, UNITED STATES
Zhong, Zhaohui, Cambridge, MA, UNITED STATES
PI US 2003089899 A1 20030515
AI US 2002-196337 A1 20020716 (10)
RLI Continuation-in-part of Ser. No. US 2002-152490, filed on 20 May 2002, ABANDONED Continuation-in-part of Ser. No. US 2002-152490, filed on 20 May 2002, ABANDONED Continuation-in-part of Ser. No. US 2001-935776, filed on 22 Aug 2001, PENDING
PRAI US 2001-292045P 20010518 (60)
US 2001-291896P 20010518 (60)
US 2002-354642P 20020206 (60)
US 2001-348313P 20011109 (60)
US 2000-226835P 20000822 (60)
US 2001-292121P 20010518 (60)
US 2001-292035P 20010518 (60)
US 2000-254745P 20001211 (60)
DT Utility
FS APPLICATION
LREP WOLF GREENFIELD & SACKS, PC, FEDERAL RESERVE PLAZA, 600 ATLANTIC AVENUE, BOSTON, MA, 02210-2211
CLMN Number of Claims: 709
ECL Exemplary Claim: 1
DRWN 94 Drawing Page(s)
LN.CNT 7456
AB The present invention relates generally to sub-microelectronic circuitry, and more particularly to nanometer-scale articles, including nanoscale wires which can be selectively doped at various locations and at various levels. In some cases, the articles may be single crystals.

The nanoscale wires can be doped, for example, differentially along their length, or radially, and either in terms of identity of dopant, concentration of dopant, or both. This may be used to provide both n-type and p-type conductivity in a single item, or in different items in close proximity to each other, such as in a crossbar array. The fabrication and growth of such articles is described, and the arrangement of such articles to fabricate electronic, optoelectronic, or spintronic devices and components. For example, semiconductor materials can be doped to form n-type and p-type semiconductor regions for making a variety of devices such as field effect transistors, bipolar transistors, complementary inverters, tunnel diodes, light emitting diodes, sensors, and the like.

L9 ANSWER 4 OF 11 USPATFULL on STN
AN 2002:310615 USPATFULL
TI Compositions and methods for analyte detection
IN Cote , Gerard L., College Station, TX, United States
Pishko, Michael V., College Station, TX, United States
Sirkar, Kaushik, College Station, TX, United States
Russell, Ryan, College Station, TX, United States
Anderson, Richard Rox, Lexington, MA, United States
PA The Texas A&M University System, College Station, TX, United States (U.S. corporation)
The General Hospital Corporation, Boston, MA, United States (U.S. corporation)
PI US 6485703 B1 20021126
AI US 1999-354914 19990709 (9)
PRAI US 1998-94980P 19980731 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Hartley, Michael G.
LREP Howrey Simon Arnold & White, LLP
CLMN Number of Claims: 11
ECL Exemplary Claim: 1
DRWN 23 Drawing Figure(s); 16 Drawing Page(s)
LN.CNT 4501
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Provided are a variety of chemically sensitive, stable (insoluble over a specified period of time), nontoxic, and non-antigenic hydrogel particles which undergo a measurable change in at least one electrochemical or optical property as a function of interaction with one or more substance(s) to be detected. Also provided are methods of using these hydrogel particles to detect one or more selected analytes, and in certain aspects detect one or more analytes in vivo. Further provided are devices used to detect and measure the optical or electrochemical changes.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 5 OF 11 USPATFULL on STN
AN 2002:148661 USPATFULL
TI Affinity **binding**-based system for detecting particulates in a fluid
IN Sheppard, Norman F., JR., Bedford, MA, UNITED STATES
Mian, Alec, Cambridge, MA, UNITED STATES
Kellogg, Gregory, Somerville, MA, UNITED STATES
Kieffer-Higgins, Stephen G., Dorchester, MA, UNITED STATES
Carvalho, Bruce L., Watertown, MA, UNITED STATES
PI US 2002076804 A1 20020620
AI US 2001-989259 A1 20011120 (9)
RLI Division of Ser. No. US 2000-614834, filed on 12 Jul 2000, PATENTED

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Division of Ser. No. US 1997-995056, filed on 19 Dec 1997, PATENTED
PRAI US 1996-34327P 19961220 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 South Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 39
ECL Exemplary Claim: 1
DRWN 30 Drawing Page(s)
LN.CNT 2359
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention provides methods an apparatus for detecting and quantifying particulate matter suspended in a fluid. Specifically, the invention provides an integrated, affinity-**binding** based, analytical system comprising a platform for performing an affinity-**binding** based assay for specifically **binding** particulates including microbial cells, and a detection means for detecting the particulates specifically bound to a defined surface or chamber comprising the platform. Methods for using the analytical systems of the invention are also provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 6 OF 11 USPATFULL on STN
AN 2002:60923 USPATFULL
TI Single-molecule selection methods and compositions therefrom
IN Cubicciotti, Roger S., Montclair, NJ, UNITED STATES
PI US 2002034757 A1 20020321
AI US 2001-907385 A1 20010717 (9)
RLI Continuation of Ser. No. US 1998-81930, filed on 20 May 1998, GRANTED, Pat. No. US 6287765
DT Utility
FS APPLICATION
LREP LICATA & TYRRELL P.C., 66 E. MAIN STREET, MARLTON, NJ, 08053
CLMN Number of Claims: 129
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 15716
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Single-molecule selection methods are provided for identifying target-**binding** molecules from diverse sequence and shape libraries. Complexes and imprints of selected target-**binding** molecules are also provided. The subject selection methods are used to identify oligonucleotide and nonnucleotide molecules with desirable properties for use in pharmaceuticals, drug discovery, drug delivery, diagnostics, medical devices, cosmetics, agriculture, environmental remediation, smart materials, packaging, microelectronics and nanofabrication. Single oligonucleotide molecules with desirable **binding** properties are selected from diverse sequence libraries and identified by amplification and sequencing. Alternatively, selected oligonucleotide molecules are identified by sequencing without amplification. Nonnucleotide molecules with desirable properties are identified by single-molecule selection from libraries of conjugated molecules or nucleotide-encoded nonnucleotide molecules. Alternatively, target-specific nonnucleotide molecules are prepared by imprinting selected oligonucleotide molecules into nonnucleotide molecular media. Complexes and imprints of molecules identified by single-molecule selection are shown to have broad utility as drugs, prodrugs, drug delivery systems, willfully reversible cosmetics, diagnostic reagents, sensors, transducers, actuators, adhesives, adherents and novel multimolecular devices.

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CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 7 OF 11 USPATFULL on STN
AN 2001:223894 USPATFULL
TI Methods, procedures, and formats for using microelectronic array devices to perform multiplex immunoassay analyses
IN Windhab, Norbert, Hofheim, Germany, Federal Republic of
Heller, Michael J., Encinitas, CA, United States
Anderson, Richard R., Encinitas, CA, United States
Fiechtner, Michael D., Poway, CA, United States
Nova, Tina S., Rancho Santa Fe, CA, United States
Schweitzer, Markus, Frankfurt am Main, Germany, Federal Republic of
Sundquist, Alfred R., San Diego, CA, United States
Brucher, Christoph, Sulzbach, Germany, Federal Republic of
Orwick, Jill M., San Diego, CA, United States
Muller, Jochen, Diez, Germany, Federal Republic of
Raddatz, Stefan, Wiesbaden, Germany, Federal Republic of
Ackley, Donald E., Cardiff, CA, United States
Hamon, Christian, Frankfurt am Main, Germany, Federal Republic of
PI US 2001049111 A1 20011206
AI US 2001-783763 A1 20010214 (9)
RLI Continuation-in-part of Ser. No. US 1999-374338, filed on 13 Aug 1999, PENDING
DT Utility
FS APPLICATION
LREP LYON & LYON LLP, 633 WEST FIFTH STREET, SUITE 4700, LOS ANGELES, CA, 90071
CLMN Number of Claims: 112
ECL Exemplary Claim: 1
DRWN 11 Drawing Page(s)
LN.CNT 2862
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention relates to devices and methods for carrying out multi-step and multiplex immunoaffinity **binding** reactions in microscopic formats. In particular, these devices and methods allow the user to rapidly carry out multiple immunoassays in the same sample volume, and to rapidly resolve the results of those immunoassays in an electronically assisted format. The assays may be further multiplexed in that several samples may be analyzed and visualized on the same microelectronic array. In addition, the methods and procedures of the invention allow the use of electronic stringency to further improve the specificity and accuracy of the immunoassays on the microelectronic array devices

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 8 OF 11 USPATFULL on STN
AN 2001:208448 USPATFULL
TI Affinity **binding**-based system for detecting particulates in a fluid
IN Sheppard, Jr., Norman F., Bedford, MA, United States
Mian, Alec, Cambridge, MA, United States
Kellogg, Gregory, Somerville, MA, United States
Kieffer-Higgins, Stephen G., Dorchester, MA, United States
Carvalho, Bruce L., Watertown, MA, United States
PA Tecan Trading AG, Baar, Switzerland (non-U.S. corporation)
PI US 6319468 B1 20011120
AI US 2000-614834 20000712 (9)
RLI Continuation of Ser. No. US 1997-995056, filed on 19 Dec 1997, now patented, Pat. No. US 6143247 Continuation-in-part of Ser. No. US 1996-768990, filed on 18 Dec 1996
PRAI US 1996-34327P 19961220 (60)

09567863

DT Utility
FS GRANTED
EXNAM Primary Examiner: Le, Long V.; Assistant Examiner: Do, Pensee T.
LREP McDonnell Boehnen Hulbert & Berghoff
CLMN Number of Claims: 29
ECL Exemplary Claim: 1
DRWN 30 Drawing Figure(s); 30 Drawing Page(s)
LN.CNT 2336
AB This invention provides methods and apparatus for detecting and quantifying particulate matter suspended in a fluid. Specifically, the invention provides an integrated, affinity-**binding** based, analytical system comprising a platform for performing an affinity-**binding** based assay for specifically **binding** particulates including microbial cells, and a detection device for detecting the particulates specifically bound to a defined surface or chamber comprising the platform. Methods for using the analytical systems of the invention are also provided.

L9 ANSWER 9 OF 11 USPATFULL on STN
AN 2001:152673 USPATFULL
TI Methods for detecting and identifying single molecules
IN Cubicciotti, Roger S., Montclair, NJ, United States
PA Molecular Machines, Inc., Montclair, NJ, United States (U.S. corporation)
PI US 6287765 B1 20010911
AI US 1998-81930 19980520 (9)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Fredman, Jeffrey
LREP Licata & Tyrrell P.C.
CLMN Number of Claims: 27
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 15456
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Multimolecular devices and drug delivery systems prepared from synthetic heteropolymers, heteropolymeric discrete structures, multivalent heteropolymeric hybrid structures, aptameric multimolecular devices, multivalent imprints, tethered specific recognition devices, paired specific recognition devices, nonaptameric multimolecular devices and immobilized multimolecular structures are provided, including molecular adsorbents and multimolecular adherents, adhesives, transducers, switches, sensors and delivery systems. Methods for selecting single synthetic nucleotides, shape-specific probes and specifically attractive surfaces for use in these multimolecular devices are also provided. In addition, paired nucleotide-nonnucleotide mapping libraries for transposition of selected populations of selected nonoligonucleotide molecules into selected populations of replicatable nucleotide sequences are described.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 10 OF 11 USPATFULL on STN
AN 2001:116434 USPATFULL
TI **Binding acceleration** techniques for the detection of analytes
IN Blackburn, Gary, Glendora, CA, United States
Creager, Stephen E., Central, SC, United States
Fraser, Scott, La Canada, CA, United States
Irvine, Bruce D., Glendora, CA, United States
Meade, Thomas J., Altadena, CA, United States

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O'Connor, Stephen D., Pasadena, CA, United States
Terbrueggen, Robert H., Manhattan Beach, CA, United States
Vielmetter, Jost G., Pasadena, CA, United States
Welch, Thomas W., Pasadena, CA, United States
PA Clinical Micro Sensors, Inc., Pasadena, CA, United States (U.S. corporation)
PI US 6264825 B1 20010724
AI US 1999-338726 19990623 (9)
RLI Continuation of Ser. No. US 1998-134058, filed on 14 Aug 1998
PRAI US 1998-90389P 19980623 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Tung, T.; Assistant Examiner: Noguerola, Alex
LREP Flehr Hohabch Test Albritton & Herbert LLP, Trecartin, Esq., Richard F., Silva, Esq., Robin M.
CLMN Number of Claims: 29
ECL Exemplary Claim: 1
DRWN 49 Drawing Figure(s); 22 Drawing Page(s)
LN.CNT 5644
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention relates to compositions and methods useful in the **acceleration** of **binding** of target analytes to capture ligands on surfaces. Detection proceeds through the use of an electron transfer moiety (ETM) that is associated with the target analyte, either directly or indirectly, to allow electronic detection of the ETM.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 11 OF 11 USPATFULL on STN
AN 2000:149670 USPATFULL
TI Affinity **binding**-based system for detecting particulates in a fluid
IN Sheppard, Jr., Norman F., Bedford, MA, United States
Mian, Alec, Cambridge, MA, United States
Kellogg, Gregory, Somerville, MA, United States
Kieffer-Higgins, Stephen G., Dorchester, MA, United States
Carvalho, Bruce L., Watertown, MA, United States
PA Gamera Bioscience Inc., Medford, MA, United States (U.S. corporation)
PI US 6143247 20001107
AI US 1997-995056 19971219 (8)
PRAI US 1996-34327P 19961220 (60)
DT Utility
FS Granted
EXNAM Primary Examiner: Chin, Christopher L.; Assistant Examiner: Do, Pensee T.
LREP McDonnell Boehnen Hulbert & Berghoff
CLMN Number of Claims: 40
ECL Exemplary Claim: 1
DRWN 30 Drawing Figure(s); 30 Drawing Page(s)
LN.CNT 2448
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention provides methods an apparatus for detecting and quantifying particulate matter suspended in a fluid. Specifically, the invention provides an integrated, affinity-**binding** based, analytical system comprising a platform for performing an affinity-**binding** based assay for specifically **binding** particulates including microbial cells, and a detection means for detecting the particulates specifically bound to a defined surface or chamber comprising the platform. Methods for using the analytical systems of the invention are also provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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 * * * * * * RECONNECTED TO STN INTERNATIONAL * * * * * *
SESSION RESUMED IN FILE 'BIOSIS, MEDLINE, CAPLUS, WPIDS, USPATFULL'
AT 13:59:10 ON 28 NOV 2003
FILE 'BIOSIS' ENTERED AT 13:59:10 ON 28 NOV 2003
COPYRIGHT (C) 2003 BIOLOGICAL ABSTRACTS INC.(R)
FILE 'MEDLINE' ENTERED AT 13:59:10 ON 28 NOV 2003
FILE 'CAPLUS' ENTERED AT 13:59:10 ON 28 NOV 2003
COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)
FILE 'WPIDS' ENTERED AT 13:59:10 ON 28 NOV 2003
COPYRIGHT (C) 2003 THOMSON DERWENT
FILE 'USPATFULL' ENTERED AT 13:59:10 ON 28 NOV 2003
CA INDEXING COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                      ENTRY    SESSION
FULL ESTIMATED COST                                   83.94      84.15

=> s accelerat? movement and nanoparticle and electrode
L7            5 ACCELERAT? MOVEMENT AND NANOPARTICLE AND ELECTRODE

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PROCESSING COMPLETED FOR L7
L8             5 DUP REM L7 (0 DUPLICATES REMOVED)

=> d l8 bib abs 1-5

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CR   1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];
     2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];
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     2003-237646 [23]; 2003-247253 [24]; 2003-479398 [45]; 2003-521746 [49];
     2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];
     2003-634854 [60]; 2003-810979 [76]
DNN  N2003-343591        DNC C2003-113834
TI   Detecting nucleic acid having two portions, by providing nanoparticles
     having oligonucleotides attached to it, contacting nucleic acid and
     nanoparticles to allow hybridization, and observing detectable change.
DC   B04 D16 L03 S03 U11
IN   LETSINGER, R L; LU, G; MIRKIN, C A; TATON, T A; PARK, S
PA   (LETS-I) LETSINGER R L; (LUGG-I) LU G; (MIRK-I) MIRKIN C A; (TATO-I) TATON
     T A; (NANO-N) NANOSPHERE INC
CYC  100
PI   WO 2003035829 A2 20030501 (200340)* EN  467p
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            DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR
            KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT
            RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM
            ZW
     US 2003087242 A1 20030508 (200345)
ADT  WO 2003035829 A2 WO 2002-US32088 20021008; US 2003087242 A1 Provisional US
     1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US
     1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US
     2000-176409P 20000113, Provisional US 2000-192699P 20000328, Provisional
     US 2000-200161P 20000426, Provisional US 2000-213906P 20000626, CIP of US
     2000-603830 20000626, Provisional US 2000-224631P 20000811, Provisional US
     2000-254392P 20001208, Provisional US 2000-254418P 20001208, Provisional
     US 2000-255235P 20001211, Provisional US 2000-255236P 20001211, CIP of US
     2001-760500 20010112, CIP of US 2001-820279 20010328, Provisional US
     2001-282640P 20010409, CIP of US 2001-927777 20010810, US 2001-8978
     20011207
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FDT US 2003087242 A1 CIP of US 6361944
PRAI US 2001-8978 20011207; US 2001-327864P 20011009; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-176409P 20000113; US 2000-192699P 20000328; US 2000-200161P 20000426; US 2000-213906P 20000626; US 2000-603830 20000626; US 2000-224631P 20000811; US 2000-254392P 20001208; US 2000-254418P 20001208; US 2000-255235P 20001211; US 2000-255236P 20001211; US 2001-760500 20010112; US 2001-820279 20010328; US 2001-282640P 20010409; US 2001-927777 20010810
AN 2003-430409 [40] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]; 2003-810979 [76]
AB WO2003035829 A UPAB: 20031125
NOVELTY - Detecting (M1) nucleic acid having two portions, comprising providing nanoparticles having oligonucleotides attached to it, which has a sequence complementary to sequence of two portions of nucleic acid, contacting nucleic acid and nanoparticles, to allow hybridization of oligonucleotides with two or more portions of nucleic acid, and observing a detectable change brought about by hybridization, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a kit comprising a container holding a composition comprising two types of nanoparticles having oligonucleotides attached to it, where the oligonucleotides on the first type of nanoparticles has a sequence complementary to the sequence of a first portion of a nucleic acid, and the oligonucleotides on the second type of nanoparticles has a sequence complementary to the sequence of a second portion of the nucleic acid;

(2) an aggregate probe comprising at least two types of nanoparticles having oligonucleotides attached to it, where the nanoparticles of the aggregate probe is bound to each other as a result of the hybridization of some of the oligonucleotides attached to them, and has oligonucleotides having attached to it which have a sequence complementary to a portion of the sequence of a nucleic acid;

(3) a core probe comprising at least two types of nanoparticles having oligonucleotides attached to it, where the nanoparticles is bound to each other as a result of hybridization of some of the oligonucleotides attached to it;

(4) a substrate having nanoparticles attached to it;

(5) a metallic or semiconductor **nanoparticle** having oligonucleotides attached to it, where the oligonucleotides are labeled with fluorescent molecules at the ends not attached to the **nanoparticle**;

(6) a satellite probe comprising a particle having oligonucleotides attached to it, and probe oligonucleotides hybridized to the oligonucleotides attached to the nanoparticles, and having a first portion and a second portion, where the first portion has a sequence complementary to the sequence of the first portion of oligonucleotides attached to the particles, and both portions has sequences complementary to portions of the sequence of the nucleic acid, and the probe oligonucleotide further has a reporter molecule attached to one end;

(7) a composition comprising at least two types of nanoparticles having oligonucleotides attached to it;

(8) an assembly of containers comprising a first and second containers holding nanoparticles having oligonucleotides attached to it, which has a sequence complementary to that of the oligonucleotides attached to the nanoparticles in the containers;

(9) a **nanoparticle** (I) having several different oligonucleotides attached to it which comprises recognition

oligonucleotides, each comprising a spacer portion designed so that it is bound to the **nanoparticle**, and a recognition portion having a sequence complementary to a portion of the sequence of the nucleic acid or another oligonucleotide, and optionally a type of diluent oligonucleotides;

(10) binding (M2) oligonucleotides to charged nanoparticles to produce stable **nanoparticle**-oligonucleotide conjugates;

(11) **nanoparticle**-oligonucleotide conjugates (II) which are nanoparticles having oligonucleotides attached to them which is present on the surface of the nanoparticles at a surface density sufficient so that the conjugates are stable and having a sequence complementary to a portion of the sequence of a nucleic acid or another oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) oligonucleotides having a covalently bound cyclic disulfide or polythiol functional group that can bind to the nanoparticles;

(13) nanomaterials (III) or nanostructures composed of nanoparticles having oligonucleotides attached to it, where the nanoparticles are held together by oligonucleotide connectors;

(14) detection of an analyte, preferably polyvalent analyte;

(15) preparing a nanoprobe conjugate for detecting an analyte;

(16) a nanomaterial produced, by providing linking oligonucleotide comprising two portions, two types of nanoparticles having oligonucleotides attached to it, and a complex comprised of streptavidin or avidin bound to two or more biotin molecules, each having an oligonucleotide bound to the biotin molecule, which has a sequence that is complementary to the second portion of the linking oligonucleotide, and contacting the first and second types of nanoparticles, the linking oligonucleotides and the complex, to allow hybridization of the oligonucleotides on the nanoparticles to each other and to the linking oligonucleotide and the hybridization of the oligonucleotide of the complexes to the linking oligonucleotides so that a desired nanomaterials or nanostructures is formed;

(17) **accelerating movement** of a **nanoparticle** to an **electrode** surface; and

(18) increasing stringency of hybridization that employs a substrate having bound to capture oligonucleotide probes and labeled oligonucleotide detection probes.

USE - M1, (I), (II) and the aggregate probe are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an **electrode** surface. (I) and (II) are useful for fabrication, and for separating a selected nucleic acid having two portions from other nucleic acids. (I), (II) and the aggregate probe are useful for detecting an analyte (especially polyvalent analyte) in a sample. (All claimed.)

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.

Dwg.0/71

L8 ANSWER 2 OF 5 USPATFULL on STN
AN 2003:294281 USPATFULL
TI Nanoparticles having oligonucleotides attached thereto and uses therefor
IN Park, So-Jung, Austin, TX, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
Mirkin, Chad A., Wilmette, IL, UNITED STATES
PI US 2003207296 A1 20031106
AI US 2002-266983 A1 20021008 (10)
RLI Continuation-in-part of Ser. No. US 2001-8978, filed on 7 Dec 2001, PENDING Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug

2001, PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING

PRAI US 2001-327864P 20011009 (60)
US 2000-254418P 20001208 (60)
US 2000-255236P 20001211 (60)
US 2001-282640P 20010409 (60)
US 2000-224631P 20000811 (60)
US 2000-192699P 20000328 (60)
US 2000-254392P 20001208 (60)
US 2000-255235P 20001211 (60)
US 2000-176409P 20000113 (60)
US 2000-213906P 20000626 (60)
US 2000-200161P 20000426 (60)
US 1996-31809P 19960729 (60)

DT Utility

FS APPLICATION

LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606

CLMN Number of Claims: 677

ECL Exemplary Claim: 1

DRWN 75 Drawing Page(s)

LN.CNT 12981

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle**-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

L8 ANSWER 3 OF 5 USPATFULL on STN

AN 2003:127030 USPATFULL

TI Nanoparticles having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES
Lu, Gang, Mt Prospect, IL, UNITED STATES

PI US 2003087242 A1 20030508

AI US 2001-8978 A1 20011207 (10)

RLI Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug 2001, PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21

09567863

Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-176409P 20000113 (60)
US 2000-192699P 20000328 (60)
US 2000-200161P 20000426 (60)
US 2000-213906P 20000626 (60)
US 2000-224631P 20000811 (60)
US 2000-254392P 20001208 (60)
US 2000-254418P 20001208 (60)
US 2000-255235P 20001211 (60)
US 2000-255236P 20001211 (60)
US 2001-282640P 20010409 (60)
DT Utility
FS APPLICATION
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606
CLMN Number of Claims: 626
ECL Exemplary Claim: 1
DRWN 71 Drawing Page(s)
LN.CNT 12308
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle**-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 4 OF 5 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2002-608256 [65] WPIDS
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]; 2003-810979 [76]
DNC C2002-171859
TI Detecting nucleic acid having two portions, by providing nanoparticles having oligonucleotides attached to it, contacting nucleic acid and nanoparticles to allow hybridization, and observing detectable change.
DC B04 D16
IN ELGHANIAN, R; GARIMELLA, V; LETSINGER, R L; LI, Z; MIRKIN, C A; MUCIC, R C; PARK, S; STORHOFF, J J; TATON, T A
PA (NANO-N) NANOSPHERE INC; (ELGH-I) ELGHANIAN R; (GARI-I) GARIMELLA V; (LETS-I) LETSINGER R L; (LIZZ-I) LI Z; (MIRK-I) MIRKIN C A; (MUCI-I) MUCIC R C; (PARK-I) PARK S; (STOR-I) STORHOFF J J; (TATO-I) TATON T A
CYC 98
PI WO 2002046472 A2 20020613 (200265)* EN 442p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK

DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO
RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2002030593 A 20020618 (200266)
US 2002172953 A1 20021121 (200279)

ADT WO 2002046472 A2 WO 2001-US46418 20011207; AU 2002030593 A AU 2002-30593 20011207; US 2002172953 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-176409P 20000113, Provisional US 2000-192699P 20000328, Provisional US 2000-200161P 20000426, CIP of US 2000-603830 20000626, Provisional US 2000-224631P 20000811, Provisional US 2000-254392P 20001208, Provisional US 2000-255235P 20001211, CIP of US 2001-760500 20010112, CIP of US 2001-820279 20010328, US 2001-927777 20010810

FDT AU 2002030593 A Based on WO 2002046472; US 2002172953 A1 CIP of US 6361944

PRAI US 2001-927777 20010810; US 2000-254392P 20001208; US 2000-254418P 20001208; US 2000-255235P 20001211; US 2000-255236P 20001211; US 2001-760500 20010112; US 2001-820279 20010328; US 2001-282640P 20010409; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-176409P 20000113; US 2000-192699P 20000328; US 2000-200161P 20000426; US 2000-603830 20000626; US 2000-224631P 20000811

AN 2002-608256 [65] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]; 2003-810979 [76]

AB WO 200246472 A UPAB: 20031125

NOVELTY - Detecting (M1) nucleic acid having two portions, involves providing nanoparticles having oligonucleotides attached to it, which has a sequence complementary to sequence of two portions of nucleic acid, contacting nucleic acid and nanoparticles, to allow hybridization of oligonucleotides with two or more portions of nucleic acid, and observing a detectable change brought about by hybridization.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a kit comprising a container holding a composition comprising two types of nanoparticles having oligonucleotides attached to it, where the oligonucleotides on the first type of nanoparticles has a sequence complementary to the sequence of a first portion of a nucleic acid, and the oligonucleotides on the second type of nanoparticles has a sequence complementary to the sequence of a second portion of the nucleic acid;

(2) an aggregate probe comprising at least two types of nanoparticles having oligonucleotides attached to it, where the nanoparticles of the aggregate probe is bound to each other as a result of the hybridization of some of the oligonucleotides attached to them, and has oligonucleotides having attached to it which have a sequence complementary to a portion of the sequence of a nucleic acid;

(3) a core probe comprising at least two types of nanoparticles having oligonucleotides attached to it, where the nanoparticles is bound to each other as a result of hybridization of some of the oligonucleotides attached to it;

(4) a substrate having nanoparticles attached to it;

(5) a metallic or semiconductor **nanoparticle** having oligonucleotides attached to it, where the oligonucleotides are labeled with fluorescent molecules at the ends not attached to the **nanoparticle**;

(6) a satellite probe comprising a particle having oligonucleotides attached to it, and probe oligonucleotides hybridized to the oligonucleotides attached to the nanoparticles, and having a first portion

and a second portion, where the first portion has a sequence complementary to the sequence of the first portion of oligonucleotides attached to the particles, and both portions has sequences complementary to portions of the sequence of the nucleic acid, and the probe oligonucleotide further has a reporter molecule attached to one end;

(7) a composition comprising at least two types of nanoparticles having oligonucleotides attached to it;

(8) an assembly of containers comprising a first and second containers holding nanoparticles having oligonucleotides attached to it, which has a sequence complementary to that of the oligonucleotides attached to the nanoparticles in the containers;

(9) a **nanoparticle** (I) having several different oligonucleotides attached to it which comprises recognition oligonucleotides, each comprising a spacer portion designed so that it is bound to the **nanoparticle**, and a recognition portion having a sequence complementary to a portion of the sequence of the nucleic acid or another oligonucleotide, and optionally a type of diluent oligonucleotides;

(10) binding (M2) oligonucleotides to charged nanoparticles to produce stable **nanoparticle**-oligonucleotide conjugates;

(11) **nanoparticle**-oligonucleotide conjugates (II) which are nanoparticles having oligonucleotides attached to them which is present on the surface of the nanoparticles at a surface density sufficient so that the conjugates are stable and having a sequence complementary to a portion of the sequence of a nucleic acid or another oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) oligonucleotides having a covalently bound cyclic disulfide or polythiol functional group that can bind to the nanoparticles;

(13) a **nanoparticle** conjugate for detecting an analyte, comprising nanoparticles having oligonucleotides bound to it, and oligonucleotide having bound to it a specific binding complement of an analyte having a sequence that is complementary to a portion of the oligonucleotides bound to the nanoparticles and are bound, as a result of hybridization, and a linker oligonucleotide having two portions;

(14) nonmaterials (III) or nanostructures composed of nanoparticles having oligonucleotides attached to it, where the nanoparticles are held together by oligonucleotide connectors;

(15) a kit for detecting an analyte, comprising a container holding (II), and optional support for observing a detectable change;

(16) a nanomaterial produced, by providing linking oligonucleotide comprising two portions, two types of nanoparticles having oligonucleotides attached to it, and a complex comprised of streptavidin or avidin bound to two or more biotin molecules, each having an oligonucleotide bound to the biotin molecule, which has a sequence that is complementary to the second portion of the linking oligonucleotide, and contacting the first and second types of nanoparticles, the linking oligonucleotides and the complex, to allow hybridization of the oligonucleotides on the nanoparticles to each other and to the linking oligonucleotide and the hybridization of the oligonucleotide of the complexes to the linking oligonucleotides so that a desired nanomaterials or nanostructures is formed; and

(17) **accelerating movement** of a **nanoparticle** to an **electrode** surface.

USE - (M1), (I), (II) and the aggregate probe are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an **electrode** surface. (I) and (II) are useful for fabrication, and for separating a selected nucleic acid having two portions from other

nucleic acids. (I), (II) and the aggregate probe are useful for detecting an analyte (especially polyvalent analyte) in a sample (all claimed).

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.

Dwg.0/67

L8 ANSWER 5 OF 5 USPATFULL on STN
AN 2002:307830 USPATFULL
TI Movement of biomolecule-coated nanoparticles in an electric field
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES
Letsinger, Robert L., Wilmette, IL, UNITED STATES
Mucic, Robert C., Glendale, CA, UNITED STATES
Storhoff, James J., Evanston, IL, UNITED STATES
Elghanian, Robert, Chicago, IL, UNITED STATES
Taton, Thomas Andrew, Chicago, IL, UNITED STATES
Garimella, Viswanadham, Evanston, IL, UNITED STATES
Li, Zhi, Evanston, IL, UNITED STATES
Park, So-Jung, Evanston, IL, UNITED STATES
PI US 2002172953 A1 20021121
AI US 2001-927777 A1 20010810 (9)
RLI Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN
PRAI US 1996-31809P 19960729 (60)
US 2000-176409P 20000113 (60)
US 2000-200161P 20000426 (60)
US 2000-192699P 20000328 (60)
US 2000-254392P 20001208 (60)
US 2000-255235P 20001211 (60)
US 2000-224631P 20000811 (60)
DT Utility
FS APPLICATION
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606
CLMN Number of Claims: 598
ECL Exemplary Claim: 1
DRWN 64 Drawing Page(s)
LN.CNT 11435
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle**-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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=> s accelerat? (3a) movement and nanosphere and electrode
L9            3 ACCELERAT? (3A) MOVEMENT AND NANOSPHERE AND ELECTRODE

=> s l9 not l8
L10           0 L9 NOT L8

=>
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